Impact of Corona Virus on Maritime Industry in Pakistan

Muhammad Shahzad, Javeria Zahir

Abstract:- Maritime-related industries contribute significantly to the global economy and societal well-being. The marine and shipping sector is one of the industries that has suffered as a result of the development of COVID -19. The pandemic corona virus epidemically has had a huge influence on human behavior in the water, with port closures and alterations in consumption habits affecting a range of marine industries, including "fisheries, passenger ferries, and cruise ships, all of which rely largely on people mobility and good weather" (Bennett et al., 2020). The purpose of this paper's research is to investigate and assess the impact of pandemic corona virus on Pakistan's main seaports and the marine supply chain, as well as the level of readiness, response, logistical operations, and crew sign-off and sign-on crew issues. By examining, policy advice will be proposed. The study was descriptive, and data was collected using a self-developed structured questionnaire. Questionnaire was distributed among 100 people related to maritime industry to check their responses towards impact of Pandemic corona virus on maritime industry. For the statistical analysis of the data, statistical procedures such as demographic analysis, Frequency, and Correlation are analyzed. The research presented in this paper is an evaluation of the effect of pandemic corona virus on the Pakistani maritime environment, we use the conclusions and results of this entire study to build a maritime strategy. There is a necessity to build a long-term contingency plan for organizations, as well as government support, to combat the influence of pandemic corona virus on marine domain organizations in Pakistan.

Keywords:- Marine industry, Shipping Management Companies, Global transportation, Impact of COVID 19.

I. INTRODUCTION

The COVID-19 pandemic has had far-reaching consequences for societies and economies around the globe. The coronavirus pandemic has not only disrupted global trade but also the global economy as a whole. Oil and energy consumption have decreased as a result of decreased domestic and international transportation. The pandemic known as the corona virus has affected the transport sector just as it has all others. Over eighty percent of all international cargo is transported by sea, so this also affected that industry. A significant drop in the amount of container ships calling at ports was observed at the start of the outbreak. (Ozturk and Turan, 2020). The economic and social benefits of the maritime sector are substantial. One sector hit hard by the spread of COVID-19 is the maritime and shipping industry. Some nations have shut down their ports after the outbreak of the pandemic corona virus, drastically reducing their exports and imports. Rapid drops

in productivity and utilization have been seen in countries that have implemented severe restrictions and interpersonal separating measures (Liu et al., 2020).

Shipping is essential to keeping the worldwide supply chain running during this challenging time because it is the most efficient, reliable, and economical mode of transportation. Marine industries such as " passenger ferries, fisheries, and passenger ships, all of which rely mostly on people movement and good weather" have been hit hard by corona virus epidemic, with port closures and changes in consumption habits affecting operations. (Bennett et al., 2020).

Proportion of perceived quality of working life of employees is important for understanding actual environment and for taking some potential intervention to refine quality of working lives of employees in society (Sultan, 2023).

The shipping enterprise has faced various new challenges in recent years, including trade policy, fleet deployment, green ports as well as green shipping difficulties. the arrival of pandemic corona virus pandemic has created new challenges for maritime management and operation. a port security screening, for example, might entail delays in berthing, onshore seaport transshipment, as well as hinterland traffic management, among many other things. changes in trade volume have an impact on the container shipping industry's a freight and charter rates, and shipping corporations must create resilience strategies to reduce the danger of operations being lost and restore the market to growth. (Tatenhove, 2021) during the very first quarter of 2020, many cruise ships towed back at ports without passengers as a result of pandemic corona virus 's influence. the advent of viral pandemics has created enormous obstacles to this industry since it entails public health and life safety considerations. Previous research has mostly focused on a single instance and the treatment procedure. The number of research looking at market reaction options for the pandemic corona virus epidemic phase in the cruise industry is currently minimal (Yazir et al., 2020).

This study focuses on the influence of the Pandemic corona virus on Pakistan's marine industry and maritime situational awareness capacity. It does not address the marine situational awareness of Pakistan's other maritime law enforcement organizations. The purpose of this paper's research is to achieve the following goals:

- To investigate and measure the impact of corona virus on Pakistan's main seaports.
- Investigate the impact of pandemic corona virus on Pakistani seaport traffic and the marine supply chain,

along level of readiness, response, logistical operations, and crew sign-off and sign-on crew issues.

- By examining the influence of corona virus 19on the maritime setting of Pakistan, policy advice will be proposed.

II. LITERATURE REVIEW

At the start of 2020, the Corona virus epidemic sprang out of nowhere and swiftly swept across the world. Globally, "a total of 56, 4962,000 estimated cases and 7,479,000 fatalities have been confirmed as of 24:00 on October 31". To restrict the virus's spread, many governments have imposed unprecedented traveling restrictions.Shipping is especially important in keeping the entire supply chain open during these challenging times of virus spread because it is the most reliable, cost-effective, and efficient mode of transportation, according to Bennett et al. (2020). The Corona virus outbreak has had a negative impact on how people behave in the ocean, "with port limitations and changes in patterns of consumption influencing an array of maritime sectors, along with the fishing sector, passenger ferries, and cruise vessels, all of which rely heavily on the movement of goods and people," according to a report. Ito et al., (2020) used automated identification system (AIS) information to follow all cruise ships throughout the globe from January until March 2020 to see if the mobility of cruise ships influences the transmission of coronavirus. Research indicated that the nations that allowed cruise ships activities until March 2020 had a larger pandemic corona virus infection transmission rate than other countries. According to this data, the virus ratio is also impacted by vessel size as well as port operation schedules. According to the findings of this study, the risk of transmission on large cruise ships has increased, and a huge percentage of infected cruise ship travelers as well as crew members are planning to travel from the "same homeport to the same port of call" in less than a week.(Sultan, 2023).

On November 27, 2020, "the European Maritime Safety Agency (EMSA) released a report on the impact of coronavirus on maritime industry", considering numerous elements including such ports, cruise ships, port operations in both EU as well as Far Eastern nations, vessel operations, and anchorage overcrowding. The emergence of pandemic corona virus has had a direct and indirect influence on the maritime sector, according to the research. Marine traffic has been seen to be declining, particularly between Europe and China, with a significant drop in maritime passenger transit. Roy (2020) looked into the economic downturn caused by the disease outbreak in key industries such as aerospace, oil, tourist industry, finance, and healthcare, and found that the disease outbreak spread quickly around the world, negatively impacting the volume of trade, rate of interest, economic uncertainty, and requirement and stockpile ratios.

Michail& Melas (2020) describe "how the shipping market behaved to pandemic corona virus , employed Garch regression as well as the impulsive response of the value-at-risk model". pandemic corona virus had a detrimental

influence on the crude oil vessels and dry bulk, according to experimental data. Hülya& Eda (2021) investigated the epidemic's impact on maritime freight transportation and documented the exposure points of various vessel types. The most significant change seen in this scientific investigation was in container shipping activity, with the number of ships calling at seaports substantially falling.

Ship-based maritime operations are claimed to have decreased as a result of severe constraints on people's mobility and market shifts. During the first half of 2020, researchers want to quantify and record worldwide changes in maritime traffic. Although the effects varying regionally, over time, and in accordance with confinement strategies, declines were observed in 70.2 % of the exclusive economic zones. The global downturn started in April, when traffic occupancy fell by 1.4 percent and the sample population fell by 54.8 percent. Casualties on passenger ships were significantly more severe and persisted for a longer time. A regional assessment in the "Western Mediterranean Sea" produced new information on the rate of reconstruction and long-term effects. Their method opens the door for extensive monitoring of the spread of the pandemic corona virus and potential effects on maritime traffic, which could have an effect on both the shipping sector and the health of the oceans.

III. RESEARCH METHODOLOGY

This study used a quantitative research approach to answer the study objectives' strategies. A research design is an organized framework for collecting and analyzing data for a planned study. According to Ghauri et al. (2020), it describes the sort of study, whether exploratory, descriptive, or causal, as well as the researcher's goal. In keeping with the thesis's purpose, a quantitative design method was used, with pre-designed questions pertaining the operational issues experienced by the marine sector as a result of the Pandemic corona virus outbreak(Sultan, 2023). During the pandemic era, a web-based poll was established to reach personnel in the worldwide marine business. Based on our prior research and industry expertise, our email list distributes material geared to its target demographic of managers, engineers, ship owners, seafarers, crew, operators, charterers, and others in the industry who make decisions that drive the global maritime sector.

A total of 100 Pakistanis responded to the questionnaires. The questionnaire used the Likert scale, with four sorts of questions (such as, "1 = strongly agree; 2 = agree; 3 = neutral; 4 = disagree; 5 = strongly disagree"). Our questionnaire has 25 questions that assess the commercial impact of Corona virus on the global marine sector. The questionnaire includes open-ended questions. Initially, participants were asked descriptive questions. Second, participants were asked how the coronavirus (Corona virus) pandemic has affected their organizations' business operations, capacity to acquire inputs/sell output results, obstacles of corporate experience, demand for product lines, and plans. Finally, respondents were asked to indicate financial structural challenges such as liquidity issues, government assistance or benefits, corporate or institutional

support, transaction plans, second wave activities, employee changes, and concerns about the future of the industry. The data may be processed in a number of ways to fulfil the researchers' goals and expectations. An accurate SPSS test tool that translates raw data into proven findings is one technique. The SPSS predicting module is distinct from the test section in that it anticipates and generates predictions without requiring professional expertise. In SPSS analysis, we used reliability stats to evaluate "scale stats, descriptive analysis, correlation analysis, regression analysis, ANOVA, convergent validity, and discriminate validity". (Tillakaratne et al., 2019).

The instrument's reliability was tested through a pilot study with 10 respondents, which was statistically evaluated with a Cronbach alpha of 0.8 or 80%. An acceptable questionnaire must have an Aa value of at least 60% in order to be approved. (Malhotra., 2004)

IV. ANALYSIS

Thisresearchis descriptive in nature and figures was collected using a self-developed structured questionnaire. Questionnaire was distributed among 100 people related to maritime industry to check their responses towards impact of Pandemic corona virus on maritime industry. For the statisticalcalculation of the data, procedures such as percentages, frequency, demographic analysis, mean, SDand Correlation are analyzed.

V. DEMOGRAPHIC ANALYSIS

The gender distribution for the expert survey constituted male respondents with 39% and female respondents with 61%. In the study 13% people are of age 18-25 years, 29% experts are of age 26-40 years, 31% experts are of age 41-50 years and 27% experts are of age 51-60 years. Regarding expert professional field, 5% of experts have worked in sea port authorities, 16% experts worked in passenger/ Freight Transport and Logistics, 22% experts worked in Maritime- Administration Planning & Policy Maritime, 21 % experts worked in Maritime training institutes, 8% experts worked in Maritime- Environmental Pollution, 16% experts worked in Shipping Agents Port & Offshore Management, 4% experts worked in Crew Manning Companies, 5% experts worked in Ship management companies while 3% experts worked in Shipyards. Regarding Professionals years' experience 24% experts have experience of 6-10 years, 25% experts have experience of 11-20 years, and 20 % experts have experience of 21-30 years while 31% experts have experience of 31-40 years. In the study three crewing companies were included in which 31% experts are from M. International Service, 33% experts are from Jupiter Marine Services and 36% experts are from Terra-Marine Agencies (Pvt) Ltd.

Table 1: Demographic analysis

Variable	Value	Frequency	Percentage
Gender	Male	61	39.0
	Female	39	61.0
Age Group	18-25 years	13	13.0
	26-40 years	29	29.0
	41-50 years	31	31.0
	51-60 years	27	27.0
Professional Field	Sea Port Authorities (KPT, PQ, GPA)	5	5.0
	Passenger/ Freight Transport & Logistics	16	16.0
	Maritime -Administration Planning & Policy Maritime	22	22.0
	Maritime training institutes	21	21.0
	Maritime – Environment Pollution	8	8.0
	Shipping Agents Port & Offshore Management	16	16.0
	Crew Manning Companies	4	4.0
	Ship management companies	5	5.0
	Shipyards	3	3.0
Professional Experience	06-10 years	24	24.0
	11-20 years	25	25.0
	21-30 years	20	20.0
	31-40 years	31	31.0
Crewing Companies	M. International Service	31	31.0
	Jupiter Marine Services	33	33.0
	Terra-Marine Agencies (Pvt) Ltd.	36	36.0
Shipping Management Companies	Pakistan National Shipping Corporation	33	33.0
	Global radiance ship management	31	31.0
	Marine Fleet	36	36.0

Three shipping management companies are taken into account for study in which 33% experts are included from Pakistan National Shipping Corporation, 31% experts are from Global radiance ship management while 36% experts

are from Marine Fleet. Graphical representation of the following is given in the graphs below:

Table 2: Descriptive stats of gender

	N	Min	Max	Mean	Std. Dev	Skewness		Kurtosis	
	Stats	Stats	Stats	Stats	Stats	Stats	Std. Error	Stats	Std. Error
Gender	100	0	1	.61	.490	-.458	.241	-1.827	.478
Valid N (listwise)	100								

This Descriptive Stats table 2 shows significant results as it is shown in table that N Stats is 100, MinStats is 0, MaxStats is 1, Mean Stats is .61, Std. Dev is .490, Std. Error of Skewness is .241, Stats of Skewness is -.458, Statsof Kurtosis is -1.827, and Std. Error of Kurtosis is .478.
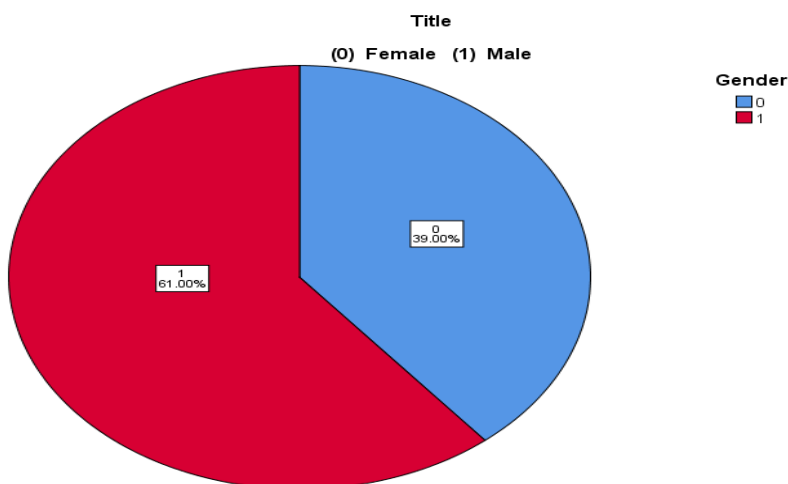

Fig. 1: Gender ratio

Graph 1, shows that respondents take part in the study mostly are male. In the study 61% male and 39% female takes part. Male ratio is high with respect to female that shows mostly works in maritime industry.

Table 3: Descriptive Stats of age group

	N	Min	Max	Mean	Std. Dev	Skewness		Kurtosis	
	Stats	Stats	Stats	Stats	Stats	Stats	Std. Error	Stats	Std. Error
Age Group	100	1	4	2.72	1.006	-.199	.241	-1.056	.478
Valid N (listwise)	100								

This Descriptive Stats table shows significant results as it is shown in table 3 that N Stats is 100, MinStats is 1, MaxStats is 4, Mean Stats is 2.72, Std. Dev is 1.006, Std. Error of Skewness is .241, Stats of Skewness is -.199, Stats of Kurtosis is -1.056, and Std. Error of Kurtosis is .478.
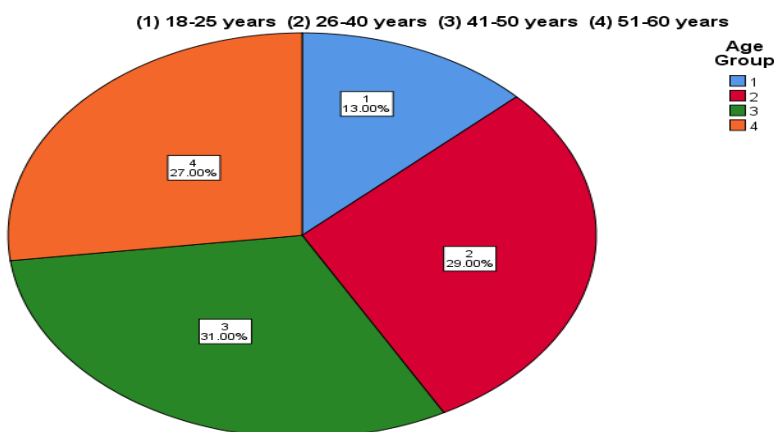

Fig. 2: Age group Ration

Graph 2 shows that in the study 13% people are of age 18-25 years, 29% experts are of age 26-40 years, 31% experts are of age 41-50 years and 27% experts are of age 51-60 year.

Table 4: Descriptive stats of professional field

	N Stats	Min Stats	Max Stats	Mean Stats	Std. Dev Stats	Skewness		Kurtosis	
						Stats	Std. Error	Stats	Std. Error
Professional Field	100	1	9	4.18	1.987	.581	.241	-.316	.478
Valid N (listwise)	100								

This Descriptive Stats table shows significant results as it is shown in table 4, N Stats is 100, MinStats is 1, MaxStats is 9, Mean Stats is 4.18, Std. Dev is 1.987, Std. Error of Skewness is .241, Stats of Skewness is .581, Stats of Kurtosis is -.316, and Std. Error of Kurtosis is .478.
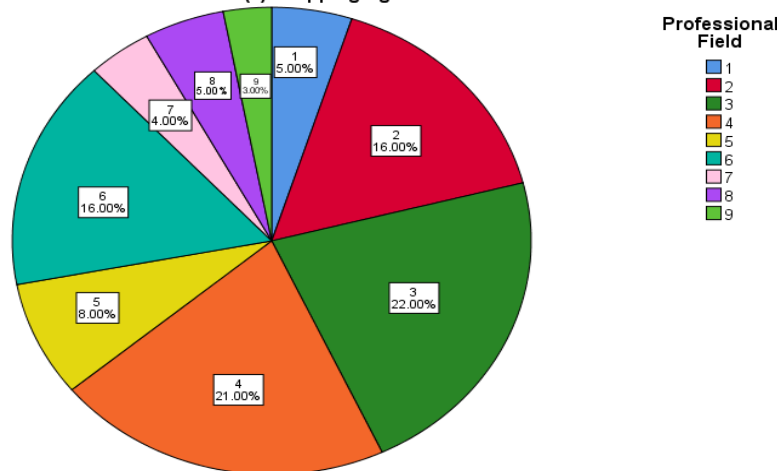

Fig. 3: Professional filed ratio

Graph 3 represent that 5% of experts have worked in sea port authorities, 16% experts worked in passenger/ Freight Transport and Logistics, 22% experts worked in Maritime- Administration Planning & Policy Maritime, 21 % experts worked in Maritime training institutes, 8% experts worked in Maritime- Environmental Pollution, 16% experts worked in Shipping Agents Port & Offshore Management, 4% experts worked in Crew Manning Companies, 5% experts worked in Ship management companies while 3% experts worked in Shipyards.

Table 5: Descriptive Stats of professional experience

	N	Min	Max	Mean	Std. Dev	Skewness		Kurtosis	
	Stats	Stats	Stats	Stats	Stats	Stats	Std. Error	Stats	Std. Error
Professional Experience	100	1	9	4.18	1.987	.581	.241	-.315	.408
Valid N (listwise)	100								

This Descriptive Stats table shows significant results as it is shown in table 5, N Stats is 100, MinStats is 1, MaxStats is 9, Mean Stats is 4.18, Std. Dev is 1.987, Std. Error of Skewness is .241, Stats of Skewness is .581, Stats of Kurtosis is -.315, and Std. Error of Kurtosis is .408.
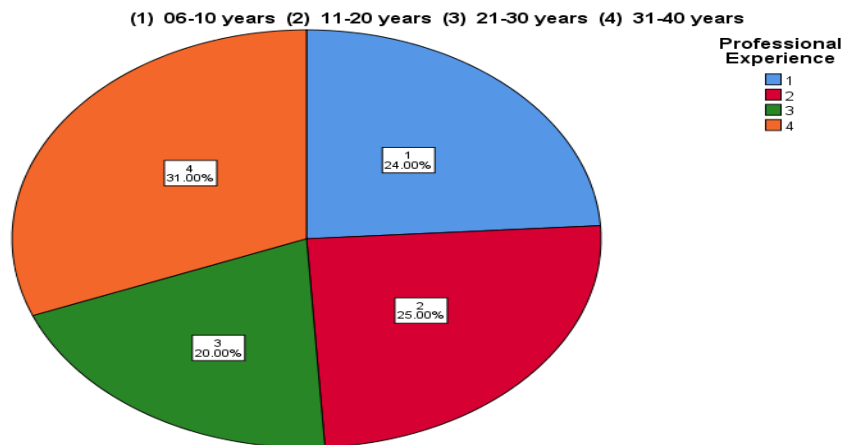
Fig. 4: Professional Experience

Graph 4 represents that 24% experts have experience of 6-10 years, 25% experts have experience of 11-20 years, and 20 % experts have experience of 21-30 years while 31% experts have experience of 31-40 years.

Table 6: Descriptive stats of Crewing companies

	N Stats	Min Stats	Max Stats	Mean Stats	Std. Dev Stats	Skewness Stats	Std. Error	Kurtosis Stats	Std. Error
Crewing Companies	100	1	3	2.05	.821	-.094	.241	-1.511	.478
Valid N (listwise)	100								

This Descriptive Stats table 6, shows significant results as it is shown in table 6 N Stats is 100, MinStats is 1, MaxStats is 3, Mean Stats is 2.05, Std. Dev is .821, Std. Error of Skewness is .241, Stats of Skewness is -.094, Stats of Kurtosis is -1.511, and Std. Error of Kurtosis is .478.

Fig. 5: Crewing Companies

Figure 5 shows that 31% experts are from M. International Service, 33% experts are from Jupiter Marine Services and 36% experts are from Terra-Marine Agencies (Pvt) Ltd.

Table 7: Descriptive stats Shipping Management Companies

	N Stats	Min Stats	Max Stats	Mean Stats	Std. Dev Stats	Skewness Stats	Std. Err	Kurtosis Stats	Std. Err
Shipping Management Companies	100	1	3	2.03	.834	-.057	.241	-1.564	.478
Valid N (listwise)	100								

This Descriptive Stats table 7, shows significant results as it is shown in table N Stats is 100, MinStats is 1, MaxStats is 3, Mean Stats is 2.03, Std. Dev is .834, Std. Error of Skewness is .241, Stats of Skewness is -.057, Stats of Kurtosis is -1.564, and Std. Error of Kurtosis is .478.

(1) Pakistan National Shipping Corporation   (2)   Global radiance ship management   (3)   Marine Fleet
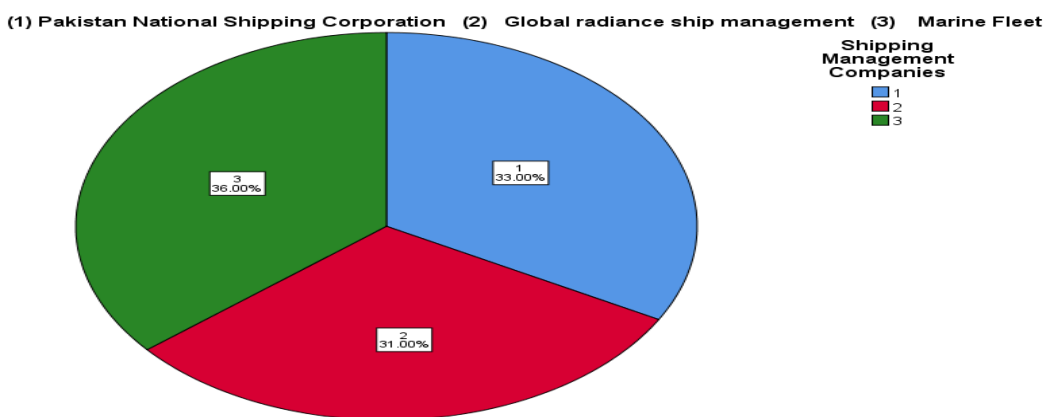

Fig. 6: Shipping Management Companies

Figure 6 shows that 33% experts are included from Pakistan National Shipping Corporation, 31% experts are from Global radiance ship management while 36% experts are from Marine Fleet.

Table 8: Correlation Analysis
Correlations

		Gender	Age Group	Professional Field	Professional Experience	Crewing Companies	Shipping Management Companies
Gender	Pearson Correlation	1	-.162	.000	.011	.024	.078
	Sig. (2-tailed)		.107	.998	.914	.814	.439
	N	100	100	100	100	100	100
Age Group	Pearson Correlation	-.162	1	-.035	.166	-.068	.010
	Sig. (2-tailed)	.107		.728	.099	.498	.920
	N	100	100	100	100	100	100
Professional Field	Pearson Correlation	.000	-.035	1	.146	.019	.149
	Sig. (2-tailed)	.998	.728		.146	.850	.139
	N	100	100	100	100	100	100
Professional Experience	Pearson Correlation	.011	.166	.146	1	.001	-.132
	Sig. (2-tailed)	.914	.099	.146		.992	.189
	N	100	100	100	100	100	100
Crewing Companies	Pearson Correlation	.024	-.068	.019	.001	1	-.032
	Sig. (2-tailed)	.814	.498	.850	.992		.754
	N	100	100	100	100	100	100
Shipping Management Companies	Pearson Correlation	.078	.010	.149	-.132	-.032	1
	Sig. (2-tailed)	.439	.920	.139	.189	.754	
	N	100	100	100	100	100	100

*Correlation is significant at the level of 0.05 (2-tailed).
** Correlation is significant at the level of 0.01 (2-tailed).

VI.   CORRELATION ANALYSIS

According to correlation findings, the maritime industry's development is influenced by the following demographic factors. These experts are crucial in changing the working conditions in the sector in response to any pandemic, and they have a significant impact on the direction of the industry. They provide the people with situational instruction and advise them on how to address industry-specific issues. These experts formulate policy and make recommendations to stakeholders and governmental organizations to address the problem. These are the answers to the 25 questions about how the pandemic corona virus affected the maritime industry that received 100 responses. Significant analysis reveals that respondents' responses were average. All of the respondents are from the maritime industry and work in that industry, so they all demonstrate the need for strategies regarding pandemics and their consequences. The results of the correlation analysis of demographic factors show that all the factors have

significance and all are related to the maritime industry, which has concerns about situational awareness of regarding the pandemic corona virus from maritime management.

The online survey sought suggestions as well as opinions on ongoing projects and long-term maritime techniques to aid in the recovery of Pakistan's marine transportation and maritime logistics sector. 100 professionals responded to this question in a structured online survey. The expert's additional suggestions section was crucial because it serves as a helpful resource for experts who want to discuss maritime issues in their region. Leaders of marine organizations believe a global epidemic would speed up their technology and communication capabilities, according to our research. The current crisis has forced businesses to respond quickly to new circumstances, revealing everyone to new, more rapid ways of interacting with customers, suppliers, ship crew, and coworkers.

Table 9: Variables
Correlations

		Maritime Management	Pandemic Corona virus	Situational Awareness
Maritime Management	Pearson Correlation	1	.045	.031
	Sig. (2-tailed)		.658	.761
	N	100	100	100
Pandemic Corona virus	Pearson Correlation	.045	1	.041
	Sig. (2-tailed)	.658		.683
	N	100	100	100
Situational Awareness	Pearson Correlation	.031	.041	1
	Sig. (2-tailed)	.761	.683	
	N	100	100	100

A correlation test was conducted to determine the connection between the effects of the pandemic corona virus and its impact on the maritime industry. The correlation values display the degree (Strong, weak, or medium relationship) and slant (positively or negatively linked) of the relationship between the items. Depending on how strong the relationship is, the correlation coefficient ranges from +1 to -1. If the two variables have a relationship value of 1, they are completely unrelated. Since the correlation coefficient approaches zero, the relationship between two values will become weaker. A + sign denotes a positive relationship, whereas a - sign denotes a negative relationship, and the coefficient sign suggests the direction of the relationship. The correlation analysis clearly demonstrates that maritime management has a significant impact on situational awareness with respect to the pandemic corona virus.

VII. DISCUSSION

In our research study analysis of questionnaire is done that shows the concern of maritime industry people. In the study 80% respondents agree with the Changes in the marine transportation and logistics sectors would increase sustainability and resilience, 88% respondents stated that, the maritime organizations in Pakistan must design a recovery plan strategy. 98% respondents agree with that government's support for the marine sector must increase. 90% respondents show their concern that experiences from pandemic corona virus would lead to major changes in marine transport and seaport logistics policymaking within five years. 80% respondents shows that the cost structure can be drastically revised in order to prepare for future community health hazards following pandemic corona virus. 90% respondents agree with the level of communication given by pandemic corona virus in the maritime setting of Pakistan. 78% respondents agree with that the economic and social systems will not revert to their pre-pandemic corona virus state. 80% respondents agree with that a secure and well-coordinated planning approach that ensures Min contact among crew and approved transportation provider employees for sign on as well as sign off. 94% respondents agree with that in view of the prevailing Covid pandemic situation, ship stores, provisions, and ship spare suppliers should not be permitted to board vessels. 100% respondents agree with that Coronavirus impacted the maritime related activities badly. 100% respondents agree with that Coronavirus has caused a lot of damage to the maritime industry because of poor infrastructure and communication concerns. 95% respondents agree that in Maritime industry community and fiscal framework will not be back to its previous state as before Pandemic Corona virus. Increased unemployment will occur due to the increased growth of online profitable operations and computerization in industry of maritime and seaport logistics sphere. 85% respondents agree with the government's additional information and answer to pandemic corona virus on the marine supply chain and port logistics supportindustries. 88% participants show that in the marine industry, a low level of adaptation leads to the unknown factor anduncertainty effect of policies and pandemic corona virus convergence. 96% respondents agree with that maritime operations and port logistical aspects are influenced by labor-related issues during pandemic corona virus. 80% respondents agree with those concerns about sustainability and restrictions on maritime operations and port logistics increased the detrimental impact of pandemic corona virus on maritime operations and port logistics. 90% respondents agree that maritime business and seaport logistics operations are partially or completely stopped down during the pandemic corona virus epidemic. the future of marine supply chain and port logistics enterprises will be

determined by the application of digitization and smart technologies. 95% respondents agree that in marine and logistics education, online training and education would be a regular approach. 88% respondents agree with that maritime officials should examine the principal negative factor that accounts for such a large percentage of pandemic corona virus 's consequences on the maritime domain. 96% respondents show their positive concern that in the Pakistan marine sector, online services will become standard after pandemic corona virus . 90% respondents agree that crew changings must be made at least three weeks before in advance to make sure the requirements of PCR test. 85% respondents agree with that crew must obtain a doctor's certificate of fitness to travel provided no more than 24 hours before disembarking the vessel. 80% respondents agree that all stores, spares and other consumable items must passed through the safety process and picked up on board by ship crew only.

96% respondents agree with that maritime operations and port logistical aspects are influenced by labor-related issues during pandemic corona virus. 80% respondents agree with those concerns about sustainability and restrictions on maritime operations and port logistics increased the detrimental impact of pandemic corona virus on maritime operations and port logistics. 90% respondents agree that maritime business and seaport logistics operations are partially or completely stopped down during the pandemic corona virus epidemic. the future of marine supply chain and port logistics enterprises will be determined by the application of digitization and smart technologies. 95% respondents agree that in marine and logistics education, online training and education would be a regular approach. 88% respondents agree with that maritime officials should examine the principal negative factor that accounts for such a large percentage of pandemic corona virus 's consequences on the maritime domain. 96% respondents shows their positive concern that in the Pakistan marine sector, online services will become standard after pandemic corona virus . 90% respondents agree that crew changings must be made at least three weeks before in advance to make sure the requirements of PCR test. 85% respondents agree with that crew must obtain a doctor's certificate of fitness to travel provided no more than 24 hours before disembarking the vessel. 80% respondents agree that all stores, spares and other consumable items must passed through the safety process and picked up on board by ship crew only.

VIII. CONCLUSION

We use the findings and conclusions from the entire study to develop a maritime strategy after evaluating the impact of the pandemic corona virus outbreak on the maritime environment in Pakistan. To combat the impact of the pandemic corona virus on Pakistan's marine domain organisations, it is imperative that organisations and the government develop a long-term contingency plan. To examine the effects on the maritime supply chain and seaport activity, the research described in this paper may be expanded to include international seaports. Future studies should involve joint research with additional marine

technology fields to analyse the effects of the pandemic corona virus on the coastal sector.

While the situation presents an impossible task for seaport operations and marine legislators, it also offers an opportunity to draw lessons from the experiences and prepare for a world after the corona virus pandemic. The networks of marine transportation providers and the owners of the cargo must improve their tools and forecasts in order to foresee disruptions and to increase the flexibility and transparency of the marine supply chain. By examining the implications and issues the maritime industry faces, this research assists professionals in the maritime industry and policymakers in developing strategies to mitigate the effects of the global health crisis and improve the industry's resilience.

IX. RECOMMENDATION

The study makes a number of suggestions for the maritime industry. There is a suggestion that policymakers can do more to boost the effectiveness of the transport and logistics industry. Transportation and logistics have been negatively impacted by the pandemic corona virus outbreak, and recovery is proving challenging. Governments may therefore support and promote improved performance as well as recovery from the pandemic crisis.

Politicians and maritime administrators are advised to place a strong emphasis on the security and safety of their organization's employees and maritime chain partners. To maintain the efficiency of ports and shipping operations, they ought to put the proper emergency response protocols into practise. The government must support marine stakeholders financially and make sure that social and economic systems are restored to their pre-pandemic, corona virus-induced state. It is necessary for the government to take a coordinated approach while working closely with partners in the private sector and other marine stakeholders. Additionally, assistance in the form of corporate recovery, accurate information delivery and effective communication, enhancing resiliency and developing sustainable processes in the sector, in addition to being the primary component of ensuring a plentiful supply of employment opportunities and operational cost control for ensuing threats and risks.

Data sharing with various stakeholders and interactions between ships and shorelines are thought to be essential for mitigation efforts, and the pandemic corona virus forces people to reevaluate such actions. It is emphasized that this is a novel issue and that the pandemic corona virus outbreak is still ongoing despite the paucity of research papers on the topic. I would encourage additional researchers to look into the long-term impacts of virus outbreak on maritime logistics and, in particular, cruise consumer experience, in order to broaden the scope of this investigation.

REFERENCES

[1.] Alamoush, A., Ballini, F., &Ölçer, A. I. (2022). Ports, maritime transport, and industry: The immediate impact of COVID-19 and the way forward. *Maritime Technology and Research*, *4*(1).

[2.] Bennett, N. J., Finkbeiner, E. M., Ban, N. C., Belhabib, D., Jupiter, S. D., Kittinger, J. N., ... & Christie, P. (2020). The COVID-19 pandemic, small-scale fisheries and coastal fishing communities. *Coastal Management*, *48*(4), 336-347.

[3.] Budd, L., and Ison, S. (2020). "Responsible Transport: A post-COVID Agenda for Transport Policy and Practice". Transportation Research Interdisciplinary Perspectives, Vol. 6, 100151.

[4.] Carballo Piñeiro, L., Mejia, M. Q., &Ballini, F. (2021). Beyond COVID-19: the future of maritime transport. *WMU Journal of Maritime Affairs*, *20*(2), 127-133.

[5.] Choquet, A., and Sam-Lefebvre, A. (2021). "Ports Closed to Cruise Ships in the Context of COVID-19: What Choices are There for Coastal States?". Annals of Tourism Research, Vol. 86, 103066.

[6.] Chua, J. Y., Foo, R., Tan, K. H., & Yuen, K. F. (2022). Maritime resilience during the COVID-19 pandemic: impacts and solutions. *Continuity & Resilience Review*.

[7.] Chua, J. Y., Foo, R., Tan, K. H., & Yuen, K. F. (2022). Maritime resilience during the COVID-19 pandemic: impacts and solutions. Continuity & Resilience Review.

[8.] Dimakou, O., Romero, M. J., & Van Waeyenberge, E. (2020). Never let a pandemic go to waste: Turbocharging the private sector for development at the World Bank. Canadian Journal of Development Studies/Revue Canadienne d'études Du Développement, 42(1–2), 221–237.

[9.] Gkiotsalitis, K., & Cats, O. (2020). Public transport planning adaption under the COVID-19 pandemic crisis: Literature review of research needs and directions. Transport Reviews, 41(3), 374–392.

[10.] Global Economy". Retrieved from SSRN: https://ssrn.com/abstract=3562570

[11.] Gordon, S., Garbi, D., Ben Bassat, S., Shapira, S., &Shelef, L. (2021). Mental adaptation to capsule work during COVID-19 outbreak: The case of Israeli Air Force Career Personnel. Military Medicine, 186(1-2), e85–e93.

[12.] Hülya, CENG˙IZ, Eda, TURAN, 2021. BUSINESS IMPACT OF COVID-19 PANDEMIC ON GLOBAL MARITIME INDUSTRY. Journal of Naval Sciences and Engineering 17 (1), 43–75.

[13.] Ito, Hirohito, Hanaoka, Shinya, Kawasaki, Tomoya, 2020. The cruise industry and the COVID-19 outbreak. Transportation Research Interdisciplinary Perspectives 5, 100136.

[14.] Kent, Paul, and Hercules Haralambides. 2022. A perfect storm or an imperfect supply chain? The U.S. supply chain crisis. *Maritime Economics and Logistics* 3: 1.

[15.] Kim K., Kim S., Park C.-Y. Food Security in Asia and the Pacific amid the COVID-19 Pandemic, ADB Briefs 2020, No. 139

[16.] Kuhn, K., Bicakci, S., & Shaikh, S. A. (2021). COVID-19 digitization in maritime: understanding cyber risks. WMU Journal of Maritime Affairs, 20(2), 193-214.

[17.] Liu, L., Miller, H.J., Scheff, J., 2020. The impacts of COVID-19 pandemic on

[18.] Liu, Y., Gayle, A. A., Wilder-Smith, A., &Rocklöv, J. (2020). The reproductive number of COVID-19 is higher compared to SARS coronavirus. Journal of travel medicine.

[19.] Loske, D. (2020). "The Impact of COVID-19 on Transport Volume and Freight Capacity Dynamics: An Empirical Analysis in German Food Retail Logistics". Transportation Research Interdisciplinary Perspectives, Vol. 6, 100165.

[20.] Luo, S., & Tsang, K. P. (2020). China and world output impact of the Hubei lockdown during the coronavirus outbreak. *Contemporary economic policy*, *38*(4), 583-592.

[21.] March, D., Metcalfe, K., Tintoré, J., & Godley, B. J. (2021). Tracking the global reduction of marine traffic during the COVID-19 pandemic. Nature communications, 12(1), 1-12.

[22.] McKibbin WJ, Fernando R. The Global Macroeconomic Impacts of COVID-19: Seven Scenarios. 2020. CAMA Working Paper No. 19/2020

[23.] Nektarios A. Michail, Kostis D. Melas. Shipping markets in turmoil: An analysis of the Covid-19 outbreak and its implications, Transportation Research Interdisciplinary Perspectives, Volume 7, 2020, 100178, ISSN 2590-1982.

[24.] Notteboom, T., &Pallis, T. (2020). IAPH-WPSP Port Economic Impact Barometer: Half Year Report. World Ports Sustainability Program and International Association of Ports &Harbours.

[25.] Ozili, P. K., and Arun, T. (2020). "Spillover of COVID-19: Impact on the

[26.] Ozturk, O., and Turan, E. (2020). "Examination of the Impact of the Covid-19 Outbreak on Sea Freight Transportation". 2 nd International Symposium of Engineering Applications on Civil Engineering and Earth Sciences (IEACES), pp. 40-47.

[27.] public transit demand in the United States. PloS One 15 (11), e0242476 World Health Org., Coronavirus Disease Dashboard (last accessed April 08,

[28.] Rewari, B. B., Mangadan-Konath, N., & Sharma, M. (2020). Impact of COVID-19 on the global supply chain of antiretroviral drugs: A rapid survey of Indian manufacturers. WHO South East Asia J Public Health , 9(2), 126– 133.

[29.] Roy, S. (2020). "Economic Impact of COVID-19 Pandemic". Technical Report.

[30.] Shehzad, K., Sarfraz, M., and Shah, S. G. M. (2020). "The Impact of COVID-19 as a Necessary Evil on Air Pollution in India During the Lockdown". Environmental Pollution. Vol. 266 Part 1, 115080. doi:10.1016/j.envpol.2020.115080.

[31.] Sultan, S. (2023). Work-related quality of life of Pakistani Doctors. *International Journal of Health Sciences*, *7*(S1), 1350–1362. https://doi.org/10.53730/ijhs.v7nS1.14324

[32.] Thuy, L. P., Tu, B. N., Tuan, P. L., & Binh, T. Q. (2020). Effects of urban transportation infrastructure development projects on residential land price in Cau Giay District, Hanoi City. *VNU Journal of Science: Earth and Environmental Sciences*, *36*(4), 57–63.

[33.] U. J. Okeleke. "A Study of the Results of Coronavirus (COVID-19) on the Nigerian Maritime Workers". AIJR Preprints, 176, version 2, 2020.

[34.] UNCATD Review of Maritime Transport 2020, 2020. COVID-19 Cuts Global Maritime Trade, Transforms Industry, 12 November 2020. accessed on 18.04.2021.

[35.] World Economic Forum (2019-2020) White paper on inclusive deployment of block chain for supply chains. World Economic Forum.

[36.] Xu, Lang, Yang, Shumiao, Chen, Jihong, Jia, Shi, 2021. The effect of COVID-19 pandemic on port performance: evidence from China. Ocean Coast Manag. 209, 105660.

[37.] Yazir, D., Şahin, B., Yip, T. L., & Tseng, P. H. (2020). Effects of COVID-19 on maritime industry: a review. International maritime health, 71(4), 253264

[38.] Yizhe Chen, Yichun Wang, Hui Wang, Zhili Hu, Lin Hua, Controlling urban traffic-one of the useful methods to ensure safety in Wuhan based on COVID-19 outbreak, Safety Science, Volume 131, 2020, 104938, ISSN 0925-7535.

[39.] Zheng, R., Xu, Y., Wang, W., Ning, G., Bi, Y., 2020. Spatial transmission of COVID-19 via public and private transportation in China. Trav. Med. Infect. Dis. 34, 101626.

[40.] Zhou, S., Lu H. L., Liu, P., and Zheng, Z. (2020). "Global Health Governance for Travel Health: Lessons Learned from the Coronavirus Disease 2019 (COVID-19) Outbreaks in Large Cruise Ships". Global Health Journal, Vol. 4 (4), pp. 133-138.